

REMARKS

This Amendment is filed in response to the Final Office Action mailed on April 26, 2006. All objections and rejections are respectfully traversed.

Claims 1-7, 9-35, 37-43, and 45-52 are currently pending.

Claim 39 is currently amended and believed allowable based on Examiner's comments.

Claims 20, 28, 34, 45-49, 51, and 52 are allowable.

Claim Rejections – 35 USC §102

At page 2 of the Office Action, claims 5, 6, 13-16, 21-24, 29, 30, 35, 37, 40, and 50 are rejected under 35 U.S.C. §102 as being anticipated by Morita et al., US Patent No. 5,876,906, hereinafter Morita.

The present invention, as set forth in representative claim 5, comprises in part:

5. A method of verifying that a plurality of disks in a volume are optimally configured comprising the steps of:
 identifying all of the disks in the volume;
 obtaining disk characteristics, respectfully, from all of the disks in the volume;
 comparing the disk characteristics with a set of policies and characteristics of spare disks; and
 alerting an administrator if a more optimal configuration of which disks are used in the volume and which disks are spare is possible.

By way of background, Morita discloses a technique for selection of disks in a disk array attached to a host computer. Spare disks are selected based upon their parity rank and parity port in the disk array, in order to preserve the parity groups in the disk array. More specifically, at Morita states at col. 4, lines 30-36:

By selecting most preferentially the spare disk unit existing in the ports other than the parity group to which the failure disk unit belongs as an alternative destination and by executing the data reconstructing process, it is possible to certainly prevent that two or more disk units included in the same parity group are allocated to the same port after the data was reconstructed.

Applicant respectfully urges that Morita does not disclose Applicant's claimed novel step of *alerting an administrator if a more optimal configuration of which disks are used in the volume and which disks are spare is possible*. In further detail, Applicant's invention allows for a background system (procedure) to determine the optimal configuration of the disk based on the disk characteristics and the policies. The system checks if there is a more optimal disk configuration without a triggering effect or a failure and alerts the administrator. Then, the administrator changes the configuration to the more optimal configuration. In contrast, Morita only changes disk upon a failure of a disk. There is no disclosure in Morita of verifying that a plurality of disks in a volume are optimally configured.

The Examiner argues that Morita shows "the controller being notified or alerted of a failed disk unit and to select a spare disk to replace it." The Examiner states Morita, show this in Morita, Col. 8, lines 37-48, which states:

"Referring again to FIG. 6, when the spare disk selecting section 52 provided in the controller 12-1 executes a set-up process for an arbi-

trary disk unit in the disk array 28 as a target to be accessed on the basis of an access request from the host computer 10, if a notification of a device error such as a hard error or the like which cannot be recovered is received from the disk unit, the spare disk selecting section 52 selects the spare disk unit serving as an alternative destination of the failure disk unit and allows the data reconstructing section 58 to execute a process to reconstruct the data of the failure disk unit into the selected spare disk unit.”

(Morita, Col. 8, lines 37-48)

In reference to the statement above, Applicant respectfully argues that Morita discloses a notification system upon a failed disk to replace the failed disk with a spare disk. In sharp contrast, Applicant’s invention allows for a system to be constantly running in the background and determining if there is a better configuration than the volume is currently using. This system allows the administrator to remove a disk before a failure occurs or to replace a disk that is better has better characteristics for the volume. The system does not require a failure or a triggering event to alert the administrator as is required in Morita.

Accordingly, Applicant respectfully urges that Morita is legally insufficient to anticipate the present claims under 35 U.S.C. §102 because of the absence of the Applicant’s claimed novel step of *alerting an administrator if a more optimal configuration of which disks are used in the volume and which disks are spare is possible*.

Claim Rejections – 35 USC § 103

At page 5 of the Office Action, claims 17-19, 25-27, and 31-33 are rejected under 35 U.S.C. §103 as being unpatentable over Morita.

Applicant respectfully notes that claim 17-19, 25-27, and 31-33 are dependent claims that depend from independent claims believed to be in condition for allowance. Accordingly, claims 17-19, 25-27, and 31-33 are believed to be in condition for allowance.

At page 7, of the Office Action, claims 1, 2, 3, 7, 9, 10, and 11 are rejected under 35 U.S.C. §103 as being unpatentable over Morita, in view of Kleiman, US Patent No. 6,317,844, hereinafter Kleiman.

The present invention, as set forth in representative claim 1, comprises in part:

1. A method for a particular file server to allocate a spare disk to replace a failed disk in a network storage system comprising the steps of:
 - identifying a set of spare disks, the set of spare disks attached to a plurality of file servers of the network storage system;
 - choosing a best spare disk of the set of spare disks*, the best spare disk attached to any of the file servers of the plurality of file servers, *the best spare disk chosen according to a plurality of user-selectable policies*; and
 - claiming ownership of the best spare disk.

Applicant respectfully urges that Morita and Kleiman, taken alone or in combination, do not teach or suggest Applicant's claimed novel step of *choosing a best spare disk of the set of spare disks ... the best spare disk chosen according to a plurality of user-selectable policies*. In further detail, Applicant's invention chooses the best spare disk based on policies that select certain disk characteristics to select the best disk. In contrast, Morita chooses a new disk based a plurality of ranks, which are determined based

on location and not policies set by a user. (Morita, col. 1, lines 32-35). Additionally, Kleiman does not mention spare disks nor *user-selectable policies* for their selection

The Examiner argues that “Morita discloses selecting spare disk according to a set of policies (ranking order). The examiner states this is shown at Morita, Col. 2, lines 33-46, which states:

“A flowchart of FIG. 3 shows an error recovery process in the case where a spare disk unit is commonly used by a plurality of ranks, namely, the case where a plurality of spare disk units are grouped and are commonly used. In this case, for instance, now assuming that a failure occurs in the disk unit 30-02 in FIG. 1, the spare disk unit 30-05 allocated to the rank R0 of the failure disk unit 30-02 is first selected in step S1. However, in the case where the spare disk unit 30-05 has failed or has already been used as an alternative destination of the other disk unit, it is judged in step S2 that the spare disk unit cannot be used. In step S5, a check is made to see if there is any other remaining spare disk unit in the other ranks or not. If YES, the spare disk unit 30-15 of the next rank R1 is selected in step S6.”

In reference to the statement above, Applicant respectfully notes that the plurality of ranks is based on the location of the disk in the array and not policies set by a user or computer. The definition of ranks in Morita, Col. 1, lines 32-35 states:

“The ranks R0 to R3 denote the numbers of arrangement stages in the port direction of the plurality of disk units connected to the ports P0 to P5.”

Morita discloses selecting disks based on the plurality of ranks (i.e. location in array) and not policies and disk characteristics, as claimed by Applicant.

Accordingly, Applicant respectfully urges the combination of Morita and Kleiman is legally insufficient to make obvious the present claims under 35 U.S.C. §103 because

of the absence of the Applicant's claimed novel *choosing a best spare disk of the set of spare disks ... the best spare disk chosen according to a plurality of user-selectable policies*.

At page 10 of the Office Action, claims 4 and 12 are rejected under 35 U.S.C. §103 as unpatentable over Morita, in view of Kleiman.

At page 11 of the Office Action, claim 38 is rejected under 35 U.S.C. §103 as unpatentable over Morita, in view of Schreiber et al., US Patent No. 6,760,862, hereinafter Schreiber.

At page 12 of the Office Action, claim 41 is rejected under 35 U.S.C. §103 as unpatentable over Morita, in view of Martinez et al., US Patent No. 5,790,782, hereinafter Martinez.

At page 12 of the Office Action, claim 42 is rejected under 35 U.S.C. §103 as unpatentable over Morita, in view of Beardsley et al., US Patent No. 6,513,097, hereinafter Beardsley.

At page 13 of the Office Action, claims 43 and 44 are rejected under 35 U.S.C. §103 as unpatentable over Morita, in view of Applicant's Admitted Prior Art.

Applicant respectfully notes that claims 4, 12, 38, and 41-44 are dependent claims that depend from independent claims believed to be in condition for allowance. Accordingly, claims 4, 12, 38, and 41-44 are believed to be in condition for allowance.

In the event that the Examiner deems personal contact desirable in disposition of this case, the Examiner is encouraged to call the undersigned attorney at (617) 951-3067.

All independent claims are believed to be in condition for allowance.

All dependent claims are believed to be dependent from allowable independent claims.

The Applicant respectfully solicits favorable action.

Please charge any additional fee occasioned by this paper to our Deposit Account No. 03-1237.

Respectfully submitted,



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